0941.65751 PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Masaru Ishiwa et al.
Serial No.:	09/930,048
Conf. No.:	1182
Filed:	August 15, 2001
For:	LIQUID-CRYSTAL DISPLAY UNIT HAVING A THIRD BOARD HAVING AT LEAST ONE OF A SIGNAL-LINE DRIVE CIRCUIT AND A SCANNING-LINE DRIVE CIRCUIT
Art Unit:	2814
Examiner:	Rao, Shrinivas H.

I hereby certify that this paper is being deposited with the United States Postal Service as FIRST-CLASS mail in an envelope addressed to: Mail Stop APPEAL BRIEF-PATENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this date.

September 7, 2004 _____
Date *Registration No. 47,954*

F-CLASS.WCM *Attorney for Applicant*
Appr. February 20, 1998

TRANSMITTAL

Mail Stop APPEAL BRIEF-PATENTS
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Transmitted herewith is a communication regarding the above-identified application.

(X) **Appellant's Brief on Appeal Under 37 C.F.R. 1.192** (in triplicate), with check for the requisite fee under 1.17(c) for $330.00. (Notice of Appeal previously filed on July 6, 2004.)

(X) If a Petition under 37 C.F.R. 1.136(a) for an extension of time for response is required to make the attached response timely and does not separately accompany this transmittal, Applicants hereby petition under 37 C.F.R. 1.136(a) for an extension of time for response in the above-identified application for the period required to make the attached response timely.

(X) The Commissioner is hereby authorized to charge any additional fees which may be required to this application under 37 C.F.R. 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-2069. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-2069. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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APPELLANT'S BRIEF ON APPEAL UNDER 37 C.F.R. 1.192

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Dear Sir:

This Appeal Brief is in support of Applicants' Notice of Appeal dated July 6, 2004, from the final rejection dated January 5, 2004.

APPEAL BRIEF

REAL PARTY IN INTEREST

The real party in interest in this case is Fujitsu Limited, 1-1, Kamikodanaka 4-Chome, Nakahara-ku, Kawasaki-shi, Kanagawa, 211, Japan. An assignment of the Application to the real party of interest has been recorded on Reel 012101, Frame 0827.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences which will directly affect, be directly affected by, or have a bearing on, the Board's decision in this pending appeal.

STATUS OF CLAIMS

This application was originally filed with ten (10) numbered claims. During prosecution, claims 2 and 6-10 were canceled, and claim 1 was amended. Claims 1 and 3-5 are pending, and stand rejected. The rejection of these claims is appealed. Claim 1 is the only independent claim. Claims 3-5 depend directly from independent claim 1.

STATUS OF AMENDMENTS

Amendment B, filed April 19, 2004, has been entered.

Amendment A, filed October 8, 2003, has been entered.

SUMMARY OF THE INVENTION

The present invention relates to an improved liquid crystal display ("LCD") device and its method of manufacture. As best seen in Fig. 4, on a glass substrate 13 is formed first boards 1 and third boards 12 together in the same process, and of the same material. The two boards are divided along the lines 17, and can be mounted according to different structural configurations, as shown in Figs. 5-8, for example. The boards may thus be connected together with a second board 5 by several different methods, including, but not limited to, flexible cables 14, using the second board 5 as a common electrode board, wire bonding 15, or flip-chip bonding 16, which could further include a solder bump, anisotropic conductive resin, or an anisotropic conductive rubber.

According to the conventional method, all electrodes and circuits are typically formed on only the first pixel electrode board 1. A defect in one of the formed circuits could therefore result in the loss of the entire board. An alternative configuration is shown by Ueda et al. (U.S. 5,838,412), and shows some of the formed circuits arranged on a third board, and connected to the first pixel electrode board by a flexible cable only, and also only with a second board sandwiched between the first and third boards. The first and third boards are

not described as having the same material composition, and therefore they must be kept apart with the second board in between, and can only be connected together by a flexible electrical bond, such as the flexible cable, to prevent the connection becoming broken as the first and third boards expand and contract in a changing thermal environment.

In contrast, according to the present invention, the respective first and third boards are manufactured together from the same process and material to ensure that these two boards have the same material composition. The present invention thus realizes an structural advantage, by forming these two boards together of the same material, that the two boards will reliably have essentially the same coefficients of thermal expansion, and thereby breaks in the connections between the two boards can be prevented during operation of the LCD device under different thermal environmental conditions, and for a wide variety of fixed and flexible connection techniques. Additionally, a further advantage is that the present invention may configure the respective boards next to each other, in addition to the conventional stacking method, and thereby realize a thinner/lower overall profile, which is known to be an important consideration in the art.

ISSUES PRESENTED

I. Whether claim 1 of the present invention was properly rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda in view of Casson, where neither reference discloses or suggests all of the structural characteristics of the present invention.

II. Whether the Examiner's lack of consideration to alleged process language in claim 1 was proper, when the product of claim 1 is not the same as, or obvious from, the prior art products, and when the Examiner even acknowledges that specific structural characteristics are imparted from the alleged process language.

GROUPING OF CLAIMS

Dependent claims 3-5 stand or fall with independent claim 1.

ARGUMENT

I. THE REJECTION OF CLAIM 1 UNDER 35 U.S.C. 103(a) AS BEING UNPATENTABLE OVER UEDA IN VIEW OF CASSON IS IMPROPER BECAUSE A *PRIMA FACIE* CASE OF OBVIOUSNESS HAS NOT BEEN ESTABLISHED AGAINST THE PRESENT INVENTION

The Section 103 rejection of independent claim 1 based on a combination of Ueda and Casson et al. (U.S. 5,502,889) is improper. A *prima facie* case of obviousness has not been established against the present invention based on these two references. The prior art of record does not teach or suggest all of the recited features and limitations of the present invention, and the Examiner has not given proper consideration to all of the structural characteristics defined by claim 1.

A. The Prior Art of Record Does Not Teach or Suggest All of the Claim Limitations of the Present Invention.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught of suggested by the prior art. See In re Royka, 490 F.2d 981, 180

USPQ 580 (CCPA 1974); see also Section 2143.03 of the MPEP. "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). In the present case however, the Examiner has not considered all of the features and limitations of the present invention, as he was required to do. Neither of the cited references, whether taken alone or in combination, teach or suggest the structure of claim 1, where the respective first and third boards have the same material composition.

The present invention stands rejected for obviousness based only on the combination of Ueda with Casson. However, the Examiner acknowledges on page 3 of Paper No. 10 that Ueda fails to disclose that the first and third boards of the present invention are formed of the same material, formed from the same process, or divided from one another after being formed together. Only Casson has been cited for teaching such features, however, Casson does not teach or suggest such features as the Examiner has asserted.

Specifically, the Examiner cites col. 5, lines 20-30 of Casson for teaching "at least three circuit boards *all made of the same material* and also coated with same materials like metal dust and epoxy layers thereon." (Emphasis added). Although the Examiner is correct that Casson describes *coating* existing boards with the same materials, Casson does not teach that the boards themselves are composed of the same materials. In other words, and as previously pointed out to the Examiner, Casson does not disclose that the boards are made of the same material, but only that they are covered with the same materials. The Examiner's additional assertions to the contrary are therefore without support from Casson.

In contrast, claim 1 of the present invention, as last amended in Amendment B, features that the third board is formed of the same material in the same process as the first board, and is then divided from the first board. Similar to the admitted deficiency in the Ueda reference, Casson also fails to teach or suggest these two boards formed of the same materials, and in the same process, and then divided. The Examiner's unwillingness to withdraw his assertions that the prior art teaches boards of the same material appears to be based upon at least two significant misreadings of both of the Ueda and Casson references.

With respect to the Ueda reference, although contradicting his earlier acknowledgement that Ueda does not teach such features, the Examiner then asserts on page 4 of Paper No. 10 that Ueda "describes several boards which are formed of the same material." (Col. 1, lines 31-42, 55-62, and col. 2, lines 1-14). This assertion is erroneous because none of these cited text portions teaches or suggests the material composition or formation of structures described therein. It is important to note that the Examiner has not maintained this assertion in the Advisory Action (Paper No. 080704), mailed subsequent to Applicants' formal response (Amendment B) to Paper No. 10, challenging the assertion.

With respect to the Casson reference, the Examiner's additional assertion that Casson shows a single board divided into several separate boards is incorrectly based upon a misreading of the reference. Fig. 1C of Casson does not show divisions between several divided boards. In fact, Fig. 1C does not even show multiple boards, as the Examiner asserts on page 4 of Paper No. 10. Instead, Casson clearly shows that Fig. 1C is only a cross-sectional view of the *single* board 10 shown in Fig. 1A. The "divisions" 25, 30, 35 between

the boards in Fig. 1C are therefore not divisions at all, but in fact only holes in the single board 10. It is important to further note that the Examiner has not reiterated these assertions as well in the Advisory Action, subsequent to Applicants' formal challenge.

Accordingly, a *prima facie* case of obviousness has not been established against claim 1 of the present invention. Neither reference teaches or suggests to at least form the specific first and third boards of claim 1 from the same materials, in addition to the other claimed features discussed above. The Examiner's assertions that either of the two references teach such features are based upon clearly erroneous misreadings of the references. For at least these reasons therefore, Applicants respectfully submit that the Examiner's final rejection of claim 1 based only on the combination of Ueda with Casson must be reversed.

B. The Prior Art Teaches Away from the Present Invention.

Not only do Ueda and Casson fail to teach or suggest all of the features of claim 1, Casson in particular even teaches away from claim 1. Any reference which teaches away from a claimed invention cannot form the basis of an obviousness rejection against that claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed Cir. 1983). In the present case therefore, Casson should be removed from consideration in an obviousness rejection against claim 1as cited by the Examiner.

Specifically, it is highly significant to note that the portion of Casson cited by the Examiner in support of the obviousness rejection (col. 5, lines 20-30) is actually part of

Casson's "Background of the Invention," and describes another prior art patent which is expressly taught to have "a number of problems" associated with the structure relied upon by the Examiner. (Col. 5, line 42, line 46). Casson even teaches that "high density multilayer circuit boards may not be reliably produced" with the described method of forming the structure cited by the Examiner. (Col. 5, lines 43-44). In other words, the Casson reference itself specifically teaches away from the very structure relied upon by the Examiner to reject claim 1 of the present invention.

Accordingly, because Casson clearly teaches away from what the Examiner asserts to describe the present invention (which assertion Applicants to not concede), Casson cannot form a basis for an obviousness rejection, and must be removed from consideration as related prior art. Applicants therefore further respectfully request that the Examiner's final rejection be reversed for at least these additional reasons.

C. The Examiner Has Not Given Proper Consideration to All Acknowledged Structural Limitations of the Present Invention.

The Examiner appears to assert in the Advisory Action that he need no longer demonstrate where in the prior art can be found all of the claimed features of the present invention by declaring all of the disputed features of claim 1 at issue to be "product-by-process limitations." The Examiner's position is erroneous.

None of the cases cited by the Examiner – In re Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985), In re Fessman, 489 F.2d 742, 180 USPQ 324 (CCPA 1974), and

In re Marosi, 710 F.2d 798, 218 USPQ 289 (Fed. Cir. 1983) – entirely relieve the Examiner of his burden to first prove a *prima facie* case of obviousness. These cases all require that Examiner must still, albeit under a lesser burden for "pure" product-by-process claims, make out a *prima facie* case before the burden shifts to Applicants to show evidence of nonobviousness. These cases are codified in Section 2113 of the MPEP, which requires the Examiner to first demonstrate that the product of the claim at issue is the same as or obvious from a product of the prior art, and then consider any structure implied by the alleged process steps (as codified from In re Garnero, 412 F.2d 276, 162 USPQ 221 (CCPA 1979)). In the present case, however, the Examiner has not satisfied either requirement.

As discussed above, the product of claim 1 of the present invention is not identical to or obvious from either Ueda or Casson, alone or in combination. Neither Ueda nor Casson teach or suggest the structural limitation that the respective first and third boards have the same material composition. It is also important to note that Casson describes only the traditional wire-and-solder types of circuit boards, and not the high-precision type of boards for LCD devices for which the present invention (as well as Ueda) is drawn. Those skilled in the art are well apprised that such LCD boards are significantly more complex than those taught by Casson, and subject to increased failure rates from production defects, and can be more heavily influenced by environmental conditions in operation. The Examiner has not cited to an expressed motivation within either prior art reference for the proposed combination of Casson with Ueda. Accordingly, obviousness has not been established under even the lesser burden.

Furthermore, the Examiner has not given full consideration to all of the clear product limitations of claim 1. As discussed above, the material compositions of the first and third boards are *structural* limitations, and not process steps. As established by Garnero, claim language such as "formed of" is capable of construction as a structural limitation, and may not even imply an additional process step. As such, claim 1 of the present invention is not a pure product-by-process claim, as was the claim at issue in Thorpe ("The product of the process of claim 1"), but instead at least what is more commonly referred to in patent law as a "hybrid claim," as reviewed by the CCPA in In re Luck, 476 F.2d 650, 177 USPQ 523 (1973). The CCPA in Luck held that "to the extent these process limitations distinguish the *product* over the prior art, they must be given the same consideration as traditional product characteristics." 177 USPQ at 524. The second prong of Section 2113 of the MPEP is therefore consistent with the holding in Luck, and should not have been disregarded by the Examiner in the present case.

Because the product of claim 1 of the present invention is not the same as or obvious from Ueda or Casson, alone or in combination, and because the Examiner has not considered all of the product and/or structural limitations of claim 1, the final rejection of claim 1 and its dependent claims should be reversed for at least these additional reasons.

II. ANY OBVIOUSNESS REJECTION BASED ON THE ART OF RECORD HAS BEEN SUFFICIENTLY REBUTTED AND OVERCOME BY APPLICANTS DURING PROSECUTION.

Assuming, for the purposes of this discussion, that a *prima facie* case of obviousness could have been established against the present invention, neither of the cited prior art references, whether taken alone or in combination, still could teach or suggest the same material composition for the first and third boards of the present invention. Applicants have sufficiently rebutted the Examiner's assertions of obviousness by establishing that the prior art teaches away from the present invention, and by establishing the nonobvious, advantageous properties of the present invention which are not realized by either of the prior art references of record.

A. Applicants Have Satisfied Even a Shifted Burden to Demonstrate that the Cited Prior Art Products Do Not Necessarily or Inherently Possess the Characteristics of the Present Invention

The Specification to the present Application, as well as many of the meritorious arguments presented in Amendments A and B, clearly establish on the record that the present invention possesses advantageous characteristics that would not be realized by the prior art. As such, Applicants have satisfied even a shifted burden that claim 1 of the present invention would not be obvious from the combination of Ueda and Casson.

Specifically, by forming the first and third boards together of the same material and from the same process, the present invention achieves with great reliability that the two

boards will have essentially the same coefficients of thermal expansion. By having the same thermal coefficients, the two boards will expand and contract together as the thermal environment demands, thereby allowing for several alternative methods of connecting the two boards together. Ueda, on the other hand, teaches only to connect the boards by way of a flexible cable. And although the present invention may also incorporate the same flexible cable configuration, it is not limited to only such a configuration, as is Ueda.

As described in the Specification on page 7, because the first and third boards may thermally expand and contract together, they may additionally be connected by several other electrical bonding methods including, but not limited to a common electrode board (the second board, wire bonding, or flip-chip bonding, further including a solder bump, anisotropic conductive resin, or anisotropic conductive rubber. Ueda teaches no such alternative connections to its flexible cable. In fact, Ueda could not even suggest such techniques because its only shown structural configuration shows the two boards sandwiching another (second) board, preventing use of the majority of these additional inflexible electrical connection techniques. Ueda's only shown structural configuration also requires a wider/higher profile than those realized by the present invention.

Casson, on the other hand, at least recognizes a problem of thermal expansion, but only in relation to the conductive adhesive layer *between* two boards, and not in relation to the boards themselves. (See col. 8, lines 10-14). Casson's solution is to provide insulating substrates and conductive metallic particles with substantially similar coefficients of thermal expansion *between* the boards, which is a very different solution than the boards themselves

having same thermal coefficients, as would be provided by claim 1 of the present invention. Casson therefore even further teaches away from the present invention, by teaching only a significantly different solution to a similar problem. Casson should therefore be removed from consideration against the present invention for at least these additional reasons.

Additionally, it is important to note that Casson, like Ueda, shows only the stacked structural configuration to the three boards. Casson therefore also fails to suggest the slimmer profiles realized by the advantageous structural features of claim 1. The structural advantages of the present invention are thus even further nonobvious over both Casson and Ueda that teach only the wider stacking configuration to the several boards.

Accordingly, Applicants have demonstrated that the present invention possesses at least the nonobvious characteristics discussed above, and have therefore successfully rebutted even a proper *prima facie* case of obviousness. Ueda fails to even consider the problem solved by the present invention, and Casson proposes a significantly different solution to a similar issue. For at least these additional reasons therefore, Applicants respectfully request that the Board reverse the Examiner's Section 103 rejection based on a combination of Ueda and Casson, and find the present invention worthy of patent protection.

B. The Examiner No Longer Disputes the Nonobvious Differences between the Present Invention and Cited Prior Art.

It is important to note that the Examiner, in his latest response to Applicants' meritorious arguments pointing out the nonobvious differences between the present invention and the prior art, no longer disputes such advantages, or rebuts the arguments presented in favor of such. As can be seen from the Advisory Action, the Examiner instead implies that such a response is unnecessary simply by declaring that claim 1 contains process language. As discussed above, however, such reasoning is improper and erroneous.

By implication therefore, the Examiner has conceded that neither Ueda nor Casson teaches or suggests the first and third board of the present invention being formed of the same material, or that the respective first and third boards shown in both prior art references are not described as being capable of expanding and contracting by the same amounts in response to thermal environmental conditions, for example, as undisputedly realized by the present invention.

Left undisputed, these advantageous features of the present invention necessarily shift the weight of evidence in favor of the patentability of the present invention. The ultimate determination of patentability is based on the entire record, by a preponderance of evidence, and with due consideration to the persuasiveness of any arguments and any secondary evidence, particularly when such arguments are left unrebutted. See In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Applicants submit that the undisputed advantages of the present invention, together with the unrebutted arguments made in favor of

patentability, require a finding that the preponderance of evidence on record can only weigh in favor of the patentability of Applicants' invention.

Applicants respectfully request that the Board make such a finding.

CONCLUSION

For all of the foregoing reasons, Applicants respectfully request that the Board reverse the Examiner's Section 103 final rejection of claims 1 and 3-5.

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Respectfully submitted,

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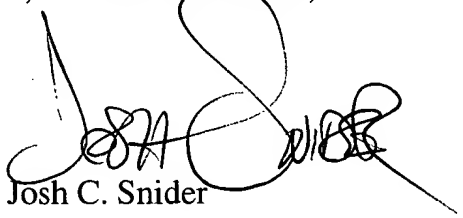
By 
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REJECTED CLAIMS

1. (Previously Presented) A liquid-crystal display unit comprising:

a first board having at least one signal line, at least one scanning line and at least one pixel electrode;

a second board having a common electrode, said second board opposing said first board;

a liquid-crystal layer provided between said first board and said second board; and

a third board having at least one of a signal-line driver driving said at least one signal line and a scanning-line driver driving said at least one scanning line, said third board being separate from said first board and said second board,

wherein said third board is formed of a same material in a same process as said first board, and is divided from said first board.

2. (Cancelled)

3. (Original) The liquid-crystal display unit as claimed in claim 1, wherein said third board is connected to said first board by a flexible cable.

4. (Original) The liquid-crystal display unit as claimed in claim 1, wherein said third board is connected to said first board by a wire bonding.

5. (Original) The liquid-crystal display unit as claimed in claim 1, wherein said third board is connected to said first board by a flip-chip bonding.

6-10. (Cancelled)